Institute, Belfast. Longmans, Green & Co. Pp. 344. 201 illustrations. $2.25 net.

It is seldom that a reviewer has the privilege of examining a book which so well accomplishes its purposes as does this elementary text on radio telegraphy. The author states in the preface that his book is designed to fill the needs of those students who, with practically no previous knowledge of electric circuits, desire to become acquainted with the simple theory of wireless telegraphy and with the various pieces of apparatus at present used in radio work. There is surely no text on the market to-day which fills the needs of such students as well as does Professor Stanley's book.

The subject-matter is all useful, live material and is strictly up to date. The historical development of the subject is given only sufficient space to make the student realize the sequence in which the different pieces of apparatus and circuits appeared in the art. Many texts devote a deal of space to detailed descriptions of the early experiments, but this text is fortunately entirely free from such irrelevant material.

The first five chapters deal with general concepts of magnetism and electricity and introduce the reader to the modern idea of the electric current being motion of electrons. Next follows a chapter on measurements and calculations of series and parallel circuits, voltage, current, power, etc. The material of this chapter is well illustrated by problems worked out in the text. Three chapters are devoted to inductance, capacity and oscillatory discharges, with methods of producing them.

Chapter X., on "How Ether Waves are Propagated and Received," deals with a very difficult subject but the author has treated it exceptionally well, bringing into his discussion, day and night effects, effect of water and dry land, etc., and illustrating his explanations by experimental data.

There are six chapters devoted to the various circuits and pieces of apparatus used in sending and receiving stations where the so-called "damped wave system" or spark system is used and one chapter on the generating and receiving apparatus used in systems using continuous waves. A short discussion on miscellaneous apparatus, such as direction finders, amplifiers, galvanometers, hot-wire meters, etc., is followed by the last chapter of the book in which various measurements of radio circuits and apparatus are described.

Four short appendices are devoted to the standard code, call letters of British stations, extracts from international radio regulations and the system of time signals and weather reports sent out from Eiffel Tower. Questions added at the end of each chapter increase the value of the book as a text.

The paper on which the book is printed is not suitable for fine half tones and these are rather disappointing, but to offset this defect the diagrams of circuits and connections are exceptionally well executed. They show thought and skill on the part of the one who designed them. There are minor errors, such as appear in Figs. 38, 43 and 45, but for a first edition the number of errors is very small. The author and publishers deserve much praise from those interested in radio work for putting out this commendable text.

J. H. M.

BOTANICAL NOTES

SOME CORRECTIONS IN REGARD TO TROPICAL LEAVES

DR. SHREVE'S paper on "The Direct Effects of Rainfall on Hygrophilous Vegetation"[1] will serve as a corrective for some "casual observation and vivid imagination" in regard to certain adaptational features, in tropical vegetation, especially those pertaining to leaf shapes and structures. His studies were made in the Jamaican forests where the rainfall ranges from 266.7 cm. (100 inches) to 426.7 cm. (170 inches), insuring, with the aid of a generally prevalent fog blanket, an almost continual wetness of the foliage. In these conditions it has generally been assumed that the leaves should have dripping points, velvet surfaces, epiphyllæ and hydathodes. And yet Dr. Shreve found "a very weak representation of such features as the hydathode, the

[1] *Journal of Ecology*, June, 1914.

dripping point, the velvet surface, the variegated leaf, drooping juvenile foliage, etc." Upon some of these structures his comments are suggestive, as,

> There is no feature of foliage leaves that appears to give greater promise of having concrete utility under rain-forest conditions than does the hydathode.

Yet in his summary he says:

> Plants possessing hydathodes are very infrequent in the montane rain forests of Jamaica.

So, too, he says: "Plants possessing dripping points are relatively uncommon in the rain-forest," and a little later, "Surface wetness does not lower the temperature of leaves sufficiently, under rain-forest conditions, to affect their transpiration rate."

The paper is so full of interesting results that it is quite impossible to summarize it as a whole, yet one rises from reading it with the feeling that it must do much to correct current notions as to the ecology of tropical leaves.

NORTH AMERICAN FLORA

Part 1 of Volume 29 of this slowly moving publication appeared August 31, 1914. It contains the following families of the Order Ericales: *Clethraceae* by N. L. Britton; *Monotropaceae,* by J. K. Small; *Lennoaceae,* by P. A. Rydberg; *Pyrolaceae,* by P. A. Rydberg, and *Ericaceae,* by J. K. Small. In the last-named family the genus *Arctostaphylos,* now named *Uva-ursi,* is treated by LeRoy Abrams.

PERENNIAL GRASS STEMS

In a recent paper on the "Development of the Culms of Grasses" (exclusive of Bamboos) by R. S. Hole, of the Imperial Forest Service of India,[2] is a paragraph which will be of interest to many a botanist:

> It is a common belief, probably due to a study of the species characteristic of temperate countries, that the culms of grasses are *annual, i. e.,* that they start growth, attain maturity and ripen grain in a period not exceeding twelve months. In some, at least, of the species of considerable economic importance which are dominant in the Savannah lands of our Indian forests this generalization does not hold good. In *Saccharum munja* Roxb. the culms are, as a rule, biennial, and a number of culms of *Saccharum arundinaceum* Retz. are now under observation in the Dehra Experimental Garden which are two years old and which, although still growing vigorously, have not yet attained maturity.

No doubt other cases of perennial stemmed grasses may be found by a little searching. A woody-stemmed south Florida grass (*Panicum latifolium* L.) appears to have a stem which continues to grow for more than one year.

SOME TEMPERATURE RELATIONS OF PLANTS

Several paragraphs in Dr. Shreve's paper on "The Rôle of Winter Temperatures in Determining the Distribution of Plants"[3] are distinctly quotable, and at the same time helpful to a better understanding of some of the temperature relations of plants. As to phenology and phenologists, he says:

> More attention has been given by phenologists to the temperature phases of the growing season, and their potentialities, than to those of the frost season. . . . The gigantic toil of the phenologists between 1850 and 1890 yielded some results on the operation of temperature, and gave us a vast accumulation of data of which some real use was made at the time, and to which we may return in future investigations. . . . Their efforts were handicapped by the fact that they worked extensively rather than intensively, and that they had not a sufficient foundation of physiological facts upon which to operate.
>
> The viewpoint of the geographer—and with him that of many floristic plant geographers—is too broad and general to give due regard to the actual physiological effects of temperature on plants; the point of view of the plant physiologist, on the other hand, is often too intensive to enable him to realize that the "conditions" of his laboratory experiment are identical with the "physical factors" of the environment of plants growing under a state of nature, and he is therefore prone to neglect the bearing of his work on the problems of the field.

From his point of view Dr. Shreve very properly criticizes the system of life zones proposed by Merriam, concluding that

[2] *Forest Bull.* 25, Calcutta, 1914.

[3] *Am. Jour. Bot.,* No. 4, 1914.

in spite of the importance of temperature as a factor in distribution it is illogical to take it as the sole criterion for the limits of distributional regions, especially when the rôle of soil and atmospheric moisture is so obviously of vital importance and is so potent in determining the areas of the principal vegetational regions of the globe.

SHORT NOTES

A YEAR or so ago F. L. Sargent published a helpful little book on applied botany, entitled "Plants and Their Uses" (Holt), and now he adds a helpful 80-page pamphlet of directions to students ("Student's Handbook") to accompany it, and to serve as a laboratory guide.

SOMEWHAT similar in design is Dr. Pool's little book, "Suggestions for Experiments in Plant Physiology" (Univ. Nebr.), consisting of 100 pages. Fifteen illustrations, mostly diagrammatic, supplement the text of very explicit directions.

THE Nature Study Society of Rockford, Ill., has issued a catalogue of "The Trees of Rockford and Vicinity," including 160 species and varieties of native and cultivated trees. Counting the starred names we find that 50 species are natives.

R. A. GORTNER and A. F. Blakeslee show[4] that this very common black mold contains a powerful water-soluble toxin, which is very harmful when injected into different parts of the body of rabbits and guinea-pigs, but apparently not harmful when *fed* to the animals. This paper is presented by the authors as a report of progress.

G. D. FULLER'S "Evaporation and Soil Moisture in Relation to the Succession of Plant Associations"[5] gives some of the results of his studies in the Chicago region. The stations included cottonwood dunes, pine dunes, oak dunes, oak-hickory forests, beech-maple forests and prairies. By graphs and diagrams the results are made evident to the eye.

"A PROVISIONAL List of Parasitic Fungi in Wisconsin,"[6] by J. J. Davis, is a revision of previous lists by Dr. Trelease and J. J. Davis, and brings our knowledge of the parasites of Wisconsin down to date. The list is in two parts, the first being systematic as to the fungi, and the second being an alphabetical list of hosts. In the first there are 61 Phycomycetes; 89 Ascomycetes; 418 Fungi Imperfecti; 339 Uredinales (+19 isolated and undetermined forms); 7 Hymenomycetes. The list includes therefore, somewhat more than nine hundred fungi (914+19).

OTHER recent short papers are J. F. Clevenger's "Effect of the Soot in Smoke on Vegetation";[7] R. M. Harper's "Coniferous Forests of Eastern North America";[8] J. E. Weaver's "Evaporation and Plant Succession in South Eastern Washington and Adjacent Idaho";[9] Darsie, Elliott and Peirce's "Study of the Germinating Power of Seeds";[10] Babcock's "Studies in Juglans," II.;[11] H. S. Jackson's "New Pomaceous Rust of Economic Importance, *Gymnosporangium blasdaleanum*";[12] Michael Levine's "Origin and Development of the lamellae in *Coprinus micaceous*";[13] and W. A. Cannon's "Specialization in Vegetation and in Environment in California."[14]

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SPECIAL ARTICLES

HADROPTERUS PELTATUS IN THE DELAWARE

SEVERAL interesting local fishes have come to my notice during the past season, the principal of which was a fine large shielded darter, *Hadropterus peltatus*. It was secured in a small pool of rapid water in the course of Skippack Creek, a tributary of the Perkiomen Creek in Montgomery County, on October 24,

[4] "Observations on the Toxin of *Rhizopus nigricans*," *Am. Jour. Physiol.*, July, 1914.
[5] *Bot. Gaz.*, September, 1914.
[6] *Trans. Wis. Acad. Sci.*, October, 1914.
[7] Bull. 7, Mellon Institute.
[8] *Pop. Sci. Mo.*, October, 1914.
[9] *Plant World*, October, 1914.
[10] *Bot. Gaz.*, August, 1914.
[11] Univ. Calif. Pub., October, 1914.
[12] *Phytopathology*, August, 1914.
[13] *Am. Jour. Bot.*, July, 1914.
[14] *Plant World*, August, 1914.